

## The Dark Side of Space

10:00:40

For billions of years, the matter which later formed our galaxy - like countless others - existed in pitch blackness.

Black is still the dominating component of our universe, which is made up of 75% dark energy, 21% dark matter, black holes (representing an unknown small percentage) and stars, which produce the light in our universe but make up only about half a % of its total energy density.

So the dark side is the key component of our universe.

To mark this year of astronomy three European specialists shed some light on the matter

**10:01:21**

**ITW Volker Springel, Max Plank Institute for Astrophysics**

**« 2009 is the year of astronomy, we want to teach the public during this year and inform it about this dark side of the universe which represents some of the deepest and the most interesting puzzle of modern physics ».**

10:01:35

Of the three components which make up the dark side, black holes have had the most publicity and have fascinated scientists and science fiction writers for a long time. These are formed when stars die or explode and transform into supernovas, giving birth to black holes.

Dark matter - which was unheard of until the 1930s - is next on the list. Observation of dark matter isn't easy as it doesn't emit light. But scientists know of its presence because of the effect it has on the gravitational pull of the objects around it.

**10:02:13**

**ITW Fabio Favata, Astronomy Missions Coordinator, ESA**

**« Suppose that you look at the dance floor in a dark hall and you have ladies in white and men in black and you don't see the men because it is dark and you see those ladies dancing around something and you don't really know what it is because you cannot see it ».**

10:02:29

The third component of the dark side is dark energy and this is perhaps the deepest mystery of all.

**10:02:36**

**ITW Volker Springel, Max Plank Institute for Astrophysics**

**«After the Big Bang the universe expanded greatly and the gravity of all the material slowed down the expansion of the universe. But then 5 billions of years ago very suddenly the universe started accelerating again its expansion and we think that is caused by this dark energy field ».**

10:02:53

But if these phenomena can't be seen, how can they be detected?

This huge hall in the Max Planck Institute in Germany is at the heart of the Virgo project. An ambitious international scheme, it aims to map the universe in images using powerful computers. Feeding these computers is information collected from astronomical satellites and telescopes both in space and here on Earth.

Whilst the dark side isn't directly visible, astronomers can map its position and effect by measuring its impact on the gravitational force of its surroundings. One of the ways this is being done is by using a very large telescope on the other side of the world, in the Atacama desert in Chile,

**10:03:42**

**ITW Reinhard Genzel, Max Plank Institute for Extraterrestrial Physics**

**« What we'll set out to do is to take the nearest object that would be suspected that black hole might reside, that's the center of our milky way and make measurements there with the better technology, big telescopes, new techniques, new detectors. Over those 20 years we're then able to measure the motion of the material, stars around where we suspect that there might be a black hole ».**

10:04:06

In cooperation with NASA, the European Space Agency is investigating black holes using the Hubble telescope as well as its own X-ray telescope XMM-Newton. Also, with missions such as Planck that study the residue left over by the big bang, scientists hope to further their understanding of the evolution of the universe.

It is difficult to imagine something you can't see or an energy you can't feel. However astronomers believe these abstract concepts are the glue that binds our universe together in an invisible dance between the seen and the unseen.

10:04:46 – THE END

### **B-Roll**

10:04:56 -ITW Volker Springel, Max Plank Institute for Astrophysics

10:05:38- ITW Fabio Favata, Astronomy Missions Coordinator, ESA

10:06:04 -ITW Reinhard Genzel, Max Plank Institute for Extraterrestrial Physics

10:06:44 -Max Planck Institute, Garching, Germany

10 :08 :30- :Very Large Telescope, Atacama desert, Chili.

10 :13 :12 – The end